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AUTHOR Newman, Isadore; Waechter, Donna
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ABSTRACT

In an earlier study, I. Newman and D. Waechter (1999) investigated graduate education students' perceptions and attitudes toward cheating in scientific research. A questionnaire was developed that was based on reactions and concerns related to cheating behavior seen in a public television video about faking scientific data. This study examined the factor structure of the developed Cheating Scale, which was administered to 167 graduate education students. Analysis identified a three-factor solution that accounted for approximately 65% of the trace. The factors were identified as Ethical/Critical Evaluation, Academic Pressure, and Human Nature. Students who scored above the median on questions about their personal dishonesty had a more complex (four-factor) factor structure on the Cheating Scale. Males and females had significantly different perceptions of cheating, with females more accepting of these behaviors than males. (Contains 20 tables and 13 references.) (SLD)

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Isadore Newman, Ph. D.
University of Akron

Donna Waechter, Ph. D.
White Hat Management

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Examination of the Factor Structure of the Cheating Scale

Isadore Newman, Ph.D.
University of Akron

Donna Waechter, Ph.D.
White Hat Management

Abstract

In an earlier study Newman and Waechter (1999) investigated graduate education students' perceptions and attitudes toward scientific cheating. A questionnaire was developed which was based on reactions/concerns related to cheating behavior. Students watched a PBS video that described several well-known scientific studies that have been publicly discredited for faking data. The students them completed a questionnaire that asked for reactions to what they had seen as well as information dealing with personal self-disclosure history and demographics. The present study will examine the factor structure of the Cheating Scale.

Introduction:

Research on cheating has estimated that college cheating has increased dramatically. (McCabe, 1993). In a study of medical school students, the majority of students admitted to cheating while in medical school. (Baird, 1980: Sierles, Hendrick, & Circle, 1980). In 1982, Singhal found that although 86% of students surveyed stated cheating is wrong, dishonest or unethical, over 56% admitted to at least one incident of cheating.

In a recent study by Newman, Newman, Gwinn and MacDonald (1999), it was found that honor students from all university disciplines studied had virtually no training in ethics. In their study open-ended responses were categorized into reaction/concerns about cheating behavior. Newman and Waechter (1999) developed a questionnaire based upon those categories, in addition to open-ended questions, in order to determine if graduate students in education have similar concepts. The questionnaire asked students for information on personal demographics as well as their reactions to the video they had just seen. Additionally, students were asked general questions about ethics and their own personal experience with cheating. The present study examines the factor structure of the Cheating Scale for all subjects. Additional factor analyses were run on selected subgroups in order to determine if the underlying constructs of the scale were viewed differently by different groups.

Method:

Subjects were 167 graduate education students who were enrolled in a research methodology class in a large mid-western university. Only subjects with complete data were included in the analysis.

Students were asked to view a PBS video on scientific cheating entitled "Scientific Research and Cheating." The video described several well known scientific studies from areas of medicine, psychology and anthropology which have been publicly discredited for faking data. After viewing the video students were asked to complete a questionnaire prior to engaging in a discussion of the ethical concerns/consequences of scientific fraud.

In order to ensure anonymity, before viewing the video, students were given two separate documents: a permission form and a questionnaire. It was explained that participation in the study was voluntary, that responses would be anonymous, and that students were under no obligation to take part. After viewing the video, those individuals wishing to take part signed the permission form and completed the questionnaire. Upon completion, one student volunteer collected the consent forms while another student volunteer collected the questionnaires.

Objectives:

- Identify the underlying factor structure of the Cheating Scale.
- Identify similarities/differences in the underlying structure of the instrument based demographic data.
- Identify similarities/differences in the underlying structure of the instrument based on an individual's history.

Results:

Table 3 identifies a three-factor solution for the Cheating Scale that accounted for approximately 65% of the trace. The first factor, which was labeled Ethical/Critical Evaluation, accounted for approximately 24% of the variance. Factor 2, Academic Pressure, accounted for approximately 22% of the variance and Factor 3, Human Nature accounted for approximately 19% of the variance.

There are different factor structures when the sample is split into two groups based on whether respondent scores were above or below the median on the Personal Experience Scale (questions 7 - 11).

For subjects who scored below the median on the Personal Experience Scale, a two-factor solution was found on the Cheating Scale. Factor 1, was identified as Safeguards, which accounted for approximately 30% of the trace, and Factor 2, Surprised/Not Natural, accounted for approximately 33% of the variance.

For students who scored above the median on the Personal Experience Scale, a four-factor solution was found. Factor 1, More Stringent Controls, accounted for approximately 23% of the trace. Factor 2, Ethics, accounted for about 21%, Factor 3, Human Nature, accounted for approximately 18% and Factor 4, Academic Pressure, accounted for approximately 18%. (See Tables 4 & 5).

It appears that students who scored above the median on questions about their personal dishonesty (having engaged in more acts of dishonesty - questions 7 - 11) had a more complex (more factors) factor structure on the Cheating Scale. (Four factors versus a two-factor solution.)

Males were significantly more likely to be surprised by cheating (question 3) than females, when holding constant age, number of years in education, educational status, and questions 7 - 11. However, the more one admitted to stealing from a store, the more often they responded that cheating was natural, when holding constant age, years in education, gender and questions 7 - 11.

Males were also more likely than females to rate higher on the need to develop better methods of fraud prevention to insure accuracy in research. However, it was surprising that the more years they had in education, the less need they felt for being critical of scientific procedures.

Implications:

Not surprisingly, people who have engaged in more dishonest behavior have a more complex structure (more factors) as related to cheating.

Males and females have significantly different perceptions of cheating, such that females are more accepting of these behaviors than males.

Since one would generally consider males and females to be members of the same society, it is surprising that they view cheating so differently. Obviously, this implies some sex stereotyping and different expectations for their behaviors related to cheating.

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Table 1a: Correlations for Factor 1

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0
/ Number of Observations

	FACTOR1	FACTOR2	FACTOR3	Q7
FACTOR1: Ethical/Critical Evaluation	1.00000 0.0 167	0.02251 0.7735 166	0.04536 0.5605 167	-0.05734 0.4672 163
FACTOR2: Academic Pressure	0.02251 0.7735 166	1.00000 0.0 168	-0.02557 0.7421 168	0.02727 0.7296 163
FACTOR3: Human Nature	0.04536 0.5605 167	-0.02557 0.7421 168	1.00000 0.0 169	-0.28563 0.0002 164
Q7 Question 7	-0.05734 0.4672 163	0.02727 0.7296 163	-0.28563 0.0002 164	1.00000 0.0 164
Q8 Question 8	0.06956 0.3776 163	-0.03468 0.6603 163	-0.28427 0.0002 164	0.44514 0.0001 164
Q9 Question 9	0.11034 0.1609 163	0.04643 0.5562 163	-0.18765 0.0161 164	0.16937 0.0301 164
Q10 Question 10	-0.06443 0.4139 163	-0.13612 0.0832 163	-0.07453 0.3429 164	0.14049 0.0728 164
Q11 Question 11	-0.06811 0.3891 162	0.16182 0.0397 162	0.09545 0.2255 163	0.22383 0.0041 163

Table 1b: Correlations for Factor

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0
/ Number of Observations

	Q8	Q9	Q10	Q11
FACTOR1:	0.06956	0.11034	-0.06443	-0.06811
Ethical/Critical	0.3776	0.1609	0.4139	0.3891
Evaluation	163	163	163	162
FACTOR2:	-0.03468	0.04643	-0.13612	0.16182
Academic Pressure	0.6603	0.5562	0.0832	0.0397
	163	163	163	162
FACTOR3:	-0.28427	-0.18765	-0.07453	0.09545
Human Nature	0.0002	0.0161	0.3429	0.2255
	164	164	164	163
Q7	0.44514	0.16937	0.14049	0.22383
Question 7	0.0001	0.0301	0.0728	0.0041
	164	164	164	163
Q8	1.00000	0.35345	0.17142	0.18114
Question 8	0.0	0.0001	0.0282	0.0207
	164	164	164	163
Q9	0.35345	1.00000	0.09131	0.01850
Question 9	0.0001	0.0	0.2449	0.8147
	164	164	164	163
Q10	0.17142	0.09131	1.00000	0.12238
Question 10	0.0282	0.2449	0.0	0.1197
	164	164	164	163
Q11	0.18114	0.01850	0.12238	1.00000
Question 11	0.0207	0.8147	0.1197	0.0
	163	163	163	163

Table 2a: Correlations for Question 4 which loaded on all factors

Correlation Analysis

	FACTOR1	FACTOR2	FACTOR3	Q4	Q7
FACTOR1:	1.00000	0.02251	0.04536	0.28878	-0.05734
Ethical/Critical	0.0	0.7735	0.5605	0.0002	0.4672
Evaluation	167	166	167	167	163
FACTOR2:	0.02251	1.00000	-0.02557	0.22004	0.02727
Academic	0.7735	0.0	0.7421	0.0042	0.7296
Pressure	166	168	168	168	163
FACTOR3	0.04536	-0.02557	1.00000	-0.13218	-0.28563
Human Nature	0.5605	0.7421	0.0	0.0867	0.0002
	167	168	169	169	164
Q4	0.28878	0.22004	-0.13218	1.00000	-0.08658
Question 4	0.0002	0.0042	0.0867	0.0	0.2703
	167	168	169	169	164
Q7	-0.05734	0.02727	-0.28563	-0.08658	1.00000
Question 7	0.4672	0.7296	0.0002	0.2703	0.0
	163	163	164	164	164
Q8	0.06956	-0.03468	-0.28427	0.02859	0.44514
Question 8	0.3776	0.6603	0.0002	0.7163	0.0001
	163	163	164	164	164
Q9	0.11034	0.04643	-0.18765	0.17208	0.16937
Question 9	0.1609	0.5562	0.0161	0.0276	0.0301
	163	163	164	164	164
Q10	-0.06443	-0.13612	-0.07453	0.12791	0.14049
Question 10	0.4139	0.0832	0.3429	0.1026	0.0728
	163	163	164	164	164
Q11	-0.06811	0.16182	0.09545	-0.02582	0.22383
Question 11	0.3891	0.0397	0.2255	0.7436	0.0041
	162	162	163	163	163

Table 2b: Correlations for Question 4 which loaded on all factors

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	Q8	Q9	Q10	Q11
FACTOR1:	0.06956	0.11034	-0.06443	-0.06811
Ethical/Critical	0.3776	0.1609	0.4139	0.3891
Evaluation	163	163	163	162
FACTOR2:	-0.03468	0.04643	-0.13612	0.16182
Academic	0.6603	0.5562	0.0832	0.0397
Pressure	163	163	163	162
FACTOR3:	-0.28427	-0.18765	-0.07453	0.09545
Human Nature	0.0002	0.0161	0.3429	0.2255
	164	164	164	163
Q4	0.02859	0.17208	0.12791	-0.02582
Question 4	0.7163	0.0276	0.1026	0.7436
	164	164	164	163
Q7	0.44514	0.16937	0.14049	0.22383
Question 7	0.0001	0.0301	0.0728	0.0041
	164	164	164	163
Q8	1.00000	0.35345	0.17142	0.18114
Question 8	0.0	0.0001	0.0282	0.0207
	164	164	164	163
Q9	0.35345	1.00000	0.09131	0.01850
Question 9	0.0001	0.0	0.2449	0.8147
	164	164	164	163
Q10	0.17142	0.09131	1.00000	0.12238
Question 10	0.0282	0.2449	0.0	0.1197
	164	164	164	163
Q11	0.18114	0.01850	0.12238	1.00000
Question 11	0.0207	0.8147	0.1197	0.0
	163	163	163	163

Table 3: Factors from Combined Data Questions 1-6

Rotation Method: Varimax.

Factor 1: Ethical Critical Evaluation
Factor 2: Academic Pressure
Facote 3: Human Nature

Orthogonal Transformation Matrix

	1	2	3
1	0.76293	0.56751	-0.30962
2	0.58776	-0.40949	0.69775
3	-0.26919	0.71432	0.64597

Rotated Factor Pattern

	FACTOR1	FACTOR2	FACTOR3	
Q1	-0.06043	0.87633	0.04884	Question 1
Q2	0.09816	0.04365	0.94081	Question 2
Q3	0.40804	0.24822	-0.40287	Question 3
Q4	0.44337	0.54204	-0.26436	Question 4
Q5	0.77534	-0.24683	0.01610	Question 5
Q6	0.69705	0.27683	0.05669	Question 6

Variance explained by each factor

FACTOR1	FACTOR2	FACTOR3
1.463387	1.262838	1.123180

Final Communality Estimates: Total = 3.849405

Q1	Q2	Q3	Q4	Q5	Q6
0.773993	0.896669	0.390413	0.560272	0.662334	0.565724

Question 1: Researchers faked their data due to pressure to produce.

Question 2: Cheating is natural; it is to be expected.

Question 3: There is a need to develop better methods to prevent fraud and assure accuracy in research.

Question 4: I was totally surprised by the cheating behavior shown on the video.

Question 5: Public schools should teach ethics as a required course.

Question 6: There is a need to be more critical of scientific procedures before accepting results.

agree 1 2 3 4 disagree

Table 4: Factors from Median Split (Sum Questions 7-11 <= 7)

Rotation Method: Varimax

Factor 1: Safeguards
Factor 2: Surprise/Not Natural

Orthogonal Transformation Matrix

	1	2
1	0.88754	0.46073
2	0.46073	-0.88754

Rotated Factor Pattern

	FACTOR1	FACTOR2	
Q1	0.39650	0.51389	Question 1
Q2	0.14548	-0.66398	Question 2
Q3	0.09838	0.59605	Question 3
Q4	0.70316	0.43348	Question 4
Q5	0.76374	-0.24513	Question 5
Q6	0.75308	0.10783	Question 6

Variance explained by each factor

FACTOR1	FACTOR2
1.832924	1.319844

Final Communality Estimates: Total = 3.152768

Q1	Q2	Q3	Q4	Q5	Q6
0.421301	0.462029	0.364957	0.682339	0.643380	0.578761

Question 7: Have you ever cheated on a test?

Question 8: Have you ever plagiarized?

Question 9: Have you ever faked data?

Question 10: Have you ever lied to save money?

Question 11: Have you ever stolen anything from a store?

never			often
1	2	3	4

Table 5: Factors from Median Split (Sum Questions 7-11 > 7)

Rotation Method: Varimax.

Factor 1: More Stringent Controls
Factor 2: Ethics
Factor 3: Human Nature
Factor 4: Academic Pressure

Orthogonal Transformation Matrix

	1	2	3	4
1	0.77566	0.58473	-0.18627	0.14746
2	0.25073	-0.57395	-0.15241	0.76452
3	0.43338	-0.26264	0.84499	-0.17085
4	-0.38427	0.50960	0.47756	0.60380

Rotated Factor Pattern

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	
Q1	-0.04352	-0.04228	0.05799	0.95786	Question 1
Q2	-0.00422	-0.03510	0.95221	0.04833	Question 2
Q3	0.34945	0.65589	-0.22887	0.36390	Question 3
Q4	0.78778	-0.07833	-0.23809	0.04441	Question 4
Q5	-0.07909	0.88577	0.06726	-0.17256	Question 5
Q6	0.79523	0.16781	0.26848	-0.08245	Question 6

Variance explained by each factor

FACTOR1	FACTOR2	FACTOR3	FACTOR4
1.383260	1.252103	1.095749	1.090812

Final Communality Estimates: Total = 4.821924

Q1	Q2	Q3	Q4	Q5	Q6
0.924547	0.910298	0.737114	0.685390	0.825150	0.739425

Question 7: Have you ever cheated on a test?

Question 8: Have you ever plagiarized?

Question 9: Have you ever faked data?

Question 10: Have you ever lied to save money?

Question 11: Have you ever stolen anything from a store?

never 1 2 3 often 4

Table 6: Question 1 = age male year Q7 -11: all data

Model: MODEL1
Dependent Variable:

Question 1: Researchers faked their data due to pressure to produce.

agree			disagree
1	2	3	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	3.58210	0.44776	1.217	0.2935
Error	141	51.89123	0.36802		
C Total	149	55.47333			

Root MSE	0.60665	R-square	0.0646
Dep Mean	1.48667	Adj R-sq	0.0115
C.V.	40.80598		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	1.626377	0.33446985	4.863	0.0001
AGE	1	-0.005123	0.00769262	-0.666	0.5065
MALE	1	0.122597	0.12319663	0.995	0.3214
YEAR	1	0.003086	0.01201312	0.257	0.7976
Q7	1	-0.015854	0.10441595	-0.152	0.8795
Q8	1	-0.016651	0.10458038	-0.159	0.8737
Q9	1	-0.014667	0.09960904	-0.147	0.8832
Q10	1	-0.135029	0.06667201	-2.025	0.0447
Q11	1	0.211850	0.10124138	2.093	0.0382

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 7: Question 2 = age male year Q7 -11: all data

Model: MODEL1
Dependent Variable:

Question 2: Cheating is natural; it is to be expected.

agree			disagree
1	2	3	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	14.85580	1.85697	3.046	0.0034
Error	142	86.57467	0.60968		
C Total	150	101.43046			

Root MSE	0.78082	R-square	0.1465
Dep Mean	3.19205	Adj R-sq	0.0984
C.V.	24.46139		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	3.974780	0.43034013	9.236	0.0001
AGE	1	0.000933	0.00983695	0.095	0.9246
MALE	1	-0.015956	0.15851596	-0.101	0.9200
YEAR	1	-0.006164	0.01539702	-0.400	0.6895
Q7	1	-0.323027	0.13432499	-2.405	0.0175
Q8	1	-0.243223	0.13391953	-1.816	0.0715
Q9	1	-0.163738	0.12795432	-1.280	0.2028
Q10	1	-0.007656	0.08551589	-0.090	0.9288
Q11	1	0.274345	0.13001079	2.110	0.0366

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 8: Question 3 = age male year Q7 -11: all data

Model: MODEL1
Dependent Variable:

Question 3: There is a need to develop better methods to prevent fraud and assure accuracy in research.

agree			disagree
1	2	3	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	15.81846	1.97731	2.522	0.0135
Error	142	111.33386	0.78404		
C Total	150	127.15232			

Root MSE	0.88546	R-square	0.1244
Dep Mean	2.56291	Adj R-sq	0.0751
C.V.	34.54900		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	2.706761	0.48801150	5.547	0.0001
AGE	1	-0.007971	0.01115523	-0.715	0.4761
MALE	1	0.363184	0.17975924	2.020	0.0452
YEAR	1	-0.028646	0.01746043	-1.641	0.1031
Q7	1	0.134445	0.15232635	0.883	0.3789
Q8	1	0.027158	0.15186656	0.179	0.8583
Q9	1	-0.011622	0.14510192	-0.080	0.9363
Q10	1	0.121630	0.09697617	1.254	0.2118
Q11	1	-0.246534	0.14743399	-1.672	0.0967

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 9: Question 4 = age male year Q7 -11: all data

Model: MODEL1
Dependent Variable:

Question 4: I was totally surprised by the cheating behavior shown on the video.

agree			disagree
1	2	3	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	4.89456	0.61182	2.517	0.0137
Error	142	34.52266	0.24312		
C Total	150	39.41722			

Root MSE	0.49307	R-square	0.1242
Dep Mean	1.23841	Adj R-sq	0.0748
C.V.	39.81469		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	1.497672	0.27174938	5.511	0.0001
AGE	1	-0.006537	0.00621179	-1.052	0.2944
MALE	1	0.254041	0.10009900	2.538	0.0122
YEAR	1	-0.004108	0.00972285	-0.423	0.6733
Q7	1	-0.171201	0.08482298	-2.018	0.0454
Q8	1	0.014543	0.08456695	0.172	0.8637
Q9	1	0.067795	0.08080006	0.839	0.4029
Q10	1	0.087569	0.05400121	1.622	0.1071
Q11	1	-0.051613	0.08209867	-0.629	0.5306

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 10: Question 5 = age male year Q7 -11: all data

Model: MODEL1
Dependent Variable:

Question 5: Public schools should teach ethics as a required course.

agree			disagree
1	2	3	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	8.95435	1.11929	1.696	0.1043
Error	142	93.73439	0.66010		
C Total	150	102.68874			

Root MSE	0.81247	R-square	0.0872
Dep Mean	1.64238	Adj R-sq	0.0358
C.V.	49.46871		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	1.352793	0.44778125	3.021	0.0030
AGE	1	0.015677	0.01023563	1.532	0.1278
MALE	1	0.298193	0.16494041	1.808	0.0727
YEAR	1	-0.022381	0.01602104	-1.397	0.1646
Q7	1	-0.063938	0.13976901	-0.457	0.6480
Q8	1	0.036800	0.13934712	0.264	0.7921
Q9	1	0.232252	0.13314014	1.744	0.0833
Q10	1	-0.105073	0.08898173	-1.181	0.2396
Q11	1	-0.137145	0.13527996	-1.014	0.3124

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 11: Question 6 = age male year Q7 -11: all data

Model: MODEL1
Dependent Variable:

Question 6: There is a need to be more critical of scientific procedures before accepting results.

agree 1 2 3 disagree 4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	4.07699	0.50962	2.382	0.0194
Error	141	30.16301	0.21392		
C Total	149	34.24000			

Root MSE	0.46252	R-square	0.1191
Dep Mean	1.28000	Adj R-sq	0.0691
C.V.	36.13415		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	1.240796	0.25530784	4.860	0.0001
AGE	1	0.011882	0.00583237	2.037	0.0435
MALE	1	0.291685	0.09398961	3.103	0.0023
YEAR	1	-0.027185	0.00915882	-2.968	0.0035
Q7	1	-0.076641	0.07957422	-0.963	0.3371
Q8	1	-0.008443	0.07989746	-0.106	0.9160
Q9	1	-0.125451	0.07591431	-1.653	0.1007
Q10	1	0.037493	0.05094052	0.736	0.4629
Q11	1	-0.006235	0.07716353	-0.081	0.9357

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 12: Factor 1 = age male year Q7-11 : all data

Model: MODEL1
Dependent Variable: FACTOR1 - Ethical Critical Evaluation

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	17.53350	2.19169	2.329	0.0222
Error	141	132.65984	0.94085		
C Total	149	150.19333			

Root MSE	0.96997	R-square	0.1167
Dep Mean	2.92667	Adj R-sq	0.0666
C.V.	33.14263		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	2.612199	0.53542243	4.879	0.0001
AGE	1	0.027229	0.01223144	2.226	0.0276
MALE	1	0.584410	0.19711163	2.965	0.0036
YEAR	1	-0.048470	0.01920754	-2.523	0.0127
Q7	1	-0.139183	0.16688020	-0.834	0.4057
Q8	1	0.040821	0.16755809	0.244	0.8079
Q9	1	0.101201	0.15920477	0.636	0.5260
Q10	1	-0.074622	0.10683063	-0.699	0.4860
Q11	1	-0.149710	0.16182458	-0.925	0.3565

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 13: Factor 2 = age male year Q7-11: all data

Model: MODEL1
Dependent Variable: FACTOR2 - Academic Pressure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	3.58210	0.44776	1.217	0.2935
Error	141	51.89123	0.36802		
C Total	149	55.47333			

Root MSE	0.60665	R-square	0.0646
Dep Mean	1.48667	Adj R-sq	0.0115
C.V.	40.80598		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	1.626377	0.33446985	4.863	0.0001
AGE	1	-0.005123	0.00769262	-0.666	0.5065
MALE	1	0.122597	0.12319663	0.995	0.3214
YEAR	1	0.003086	0.01201312	0.257	0.7976
Q7	1	-0.015854	0.10441595	-0.152	0.8795
Q8	1	-0.016651	0.10458038	-0.159	0.8737
Q9	1	-0.014667	0.09960904	-0.147	0.8832
Q10	1	-0.135029	0.06667201	-2.025	0.0447
Q11	1	0.211850	0.10124138	2.093	0.0382

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 14: Factor 3 = age male year Q7-11: all data

Model: MODEL1
Dependent Variable: FACTOR3 - Human Nature

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	14.85580	1.85697	3.046	0.0034
Error	142	86.57467	0.60968		
C Total	150	101.43046			

Root MSE	0.78082	R-square	0.1465
Dep Mean	3.19205	Adj R-sq	0.0984
C.V.	24.46139		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	3.974780	0.43034013	9.236	0.0001
AGE	1	0.000933	0.00983695	0.095	0.9246
MALE	1	-0.015956	0.15851596	-0.101	0.9200
YEAR	1	-0.006164	0.01539702	-0.400	0.6895
Q7	1	-0.323027	0.13432499	-2.405	0.0175
Q8	1	-0.243223	0.13391953	-1.816	0.0715
Q9	1	-0.163738	0.12795432	-1.280	0.2028
Q10	1	-0.007656	0.08551589	-0.090	0.9288
Q11	1	0.274345	0.13001079	2.110	0.0366

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 15 Factor 1 = age male year Q7-11: Qsum7-11 <= 7

Model: MODEL1
Dependent Variable: FACTOR1 - Ethical/Critical Evaluation

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	13.01072	1.62634	1.855	0.0824
Error	66	57.86928	0.87681		
C Total	74	70.88000			

Root MSE	0.93638	R-square	0.1836
Dep Mean	2.96000	Adj R-sq	0.0846
C.V.	31.63446		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	2.884331	1.13167736	2.549	0.0131
AGE	1	0.025153	0.01378056	1.825	0.0725
MALE	1	0.576006	0.34008079	1.694	0.0950
YEAR	1	-0.046838	0.02301338	-2.035	0.0458
Q7	1	-0.264509	0.23581705	-1.122	0.2661
Q8	1	0.146254	0.36642540	0.399	0.6911
Q9	1	-0.532183	0.42985597	-1.238	0.2201
Q10	1	-0.043840	0.20841126	-0.210	0.8340
Q11	1	0.307832	0.35149169	0.876	0.3843

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 16: Factor 2 = age male year Q7-11: Qsum7-11 <= 7

Model: MODEL1
Dependent Variable: FACTOR2 - Academic Pressure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	1.92127	0.24016	0.608	0.7681
Error	66	26.07873	0.39513		
C Total	74	28.00000			

Root MSE	0.62860	R-square	0.0686
Dep Mean	1.40000	Adj R-sq	-0.0443
C.V.	44.89968		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	1.955869	0.76318971	2.563	0.0127
AGE	1	-0.005252	0.00928531	-0.566	0.5736
MALE	1	0.107560	0.22783300	0.472	0.6384
YEAR	1	0.002137	0.01543224	0.138	0.8903
Q7	1	-0.084102	0.15859054	-0.530	0.5977
Q8	1	-0.076726	0.24554292	-0.312	0.7557
Q9	1	0.003256	0.28854431	0.011	0.9910
Q10	1	-0.220883	0.13958346	-1.582	0.1183
Q11	1	0.114459	0.23613528	0.485	0.6295

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 17: Factor 3 = age male year Q7-11: Qsum7-11 <= 7

Model: MODEL1
Dependent Variable: FACTOR3 - Human Nature

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	8.78315	1.09789	1.915	0.0720
Error	67	38.41421	0.57335		
C Total	75	47.19737			

Root MSE	0.75720	R-square	0.1861
Dep Mean	3.27632	Adj R-sq	0.0889
C.V.	23.11122		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	3.781757	0.91334517	4.141	0.0001
AGE	1	0.017166	0.01111580	1.544	0.1272
MALE	1	0.171058	0.27334944	0.626	0.5336
YEAR	1	-0.017771	0.01847876	-0.962	0.3397
Q7	1	-0.256128	0.18983174	-1.349	0.1818
Q8	1	-0.834162	0.28347698	-2.943	0.0045
Q9	1	0.088977	0.34736498	0.256	0.7986
Q10	1	0.042835	0.16802118	0.255	0.7996
Q11	1	0.173281	0.28416283	0.610	0.5441

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 18: Factor 1 = age male year Q7-11: Qsum7-11 > 7

Model: MODEL1
Dependent Variable: FACTOR1 - Ethical Critical Evaluation

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	12.01767	1.50221	1.477	0.1826
Error	66	67.12900	1.01711		
C Total	74	79.14667			

Root MSE	1.00852	R-square	0.1518
Dep Mean	2.89333	Adj R-sq	0.0490
C.V.	34.85657		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	2.788027	0.99943203	2.790	0.0069
AGE	1	0.012931	0.02810673	0.460	0.6470
MALE	1	0.465601	0.26760759	1.740	0.0865
YEAR	1	-0.037335	0.03862929	-0.966	0.3373
Q7	1	0.142569	0.26704888	0.534	0.5952
Q8	1	-0.116485	0.23624071	-0.493	0.6236
Q9	1	0.252736	0.19599331	1.290	0.2017
Q10	1	-0.088125	0.16056873	-0.549	0.5850
Q11	1	-0.332319	0.22638541	-1.468	0.1469

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 19: Factor 2 = age male year Q7-11: Qsum7-11 > 7

Model: MODEL1
Dependent Variable: FACTOR2 - Academic Pressure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	3.16583	0.39573	1.127	0.3573
Error	66	23.18083	0.35122		
C Total	74	26.34667			

Root MSE	0.59264	R-square	0.1202
Dep Mean	1.57333	Adj R-sq	0.0135
C.V.	37.66794		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	2.226709	0.58730366	3.791	0.0003
AGE	1	0.005178	0.01651656	0.313	0.7549
MALE	1	0.168944	0.15725624	1.074	0.2866
YEAR	1	-0.000948	0.02270002	-0.042	0.9668
Q7	1	-0.015668	0.15692792	-0.100	0.9208
Q8	1	-0.150354	0.13882388	-1.083	0.2827
Q9	1	-0.097996	0.11517300	-0.851	0.3979
Q10	1	-0.225898	0.09435619	-2.394	0.0195
Q11	1	0.059880	0.13303254	0.450	0.6541

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10

Table 20: Factor 3 = age male year Q7-11: Qsum7-11 > 7

Model: MODEL1
Dependent Variable: FACTOR3 - Human Nature

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	12.74548	1.59319	2.603	0.0155
Error	66	40.40118	0.61214		
C Total	74	53.14667			

Root MSE	0.78239	R-square	0.2398
Dep Mean	3.10667	Adj R-sq	0.1477
C.V.	25.18433		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	5.349071	0.77534538	6.899	0.0001
AGE	1	-0.039928	0.02180480	-1.831	0.0716
MALE	1	-0.135865	0.20760623	-0.654	0.5151
YEAR	1	0.042043	0.02996807	1.403	0.1653
Q7	1	-0.510516	0.20717279	-2.464	0.0163
Q8	1	0.014779	0.18327224	0.081	0.9360
Q9	1	-0.312544	0.15204887	-2.056	0.0438
Q10	1	-0.061612	0.12456697	-0.495	0.6225
Q11	1	0.219025	0.17562663	1.247	0.2168

Variable	DF	Variable Label
INTERCEP	1	Intercept
AGE	1	
MALE	1	
YEAR	1	
Q7	1	Question 7
Q8	1	Question 8
Q9	1	Question 9
Q10	1	Question 10